UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,087	05/29/2002	Stefan Disch	1999/G-017	9098

7590 03/27/2008

Conolly & Hutz
P O Box 2207
Wilmington, DE 19899

EXAMINER	
NUTTER, NATHAN M	
ART UNIT	PAPER NUMBER
1796	
MAIL DATE	DELIVERY MODE
03/27/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEFAN DISCH, KARL-FRIEDRICH MUECK,
and LOTHAR REISSMANN

Appeal 2008-1433
Application 10/069,087
Technology Center 1700

Decided: March 27, 2008

Before CHUNG PAK, THOMAS A. WALTZ, and
ROMULO H. DELMENDO, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of all pending claims (claims 1-3, 11, 12, 14-19, and 21-26). (Final Office Action entered July 17, 2006). We have jurisdiction under 35 U.S.C. § 6(b).

Appellants' invention relates to a colored polyoxymethylene (hereinafter "POM") molding composition made from a base material of a polyacetal copolymer prepared using a protonic acid as a polymerization initiator, with the copolymer consisting essentially of oxymethylene and oxyethylene units. (Spec. 3, ll. 27-35). Formaldehyde emission from this colored molding composition containing the recited copolymer is said to be lower than a colored molding composition having the polyacetal copolymer made with a Lewis acid as an initiator. (*Id.* 3, ll. 35-37). In another aspect, the invention also relates to "a process for reducing the formaldehyde emission of colored molding compositions made from polyacetal copolymer, which comprises adding colorants selected from the group consisting of white pigments, black pigments, and color pigments to a polyacetal copolymer which essentially consists of oxymethylene units and oxyethylene units and using a strong protonic acid as initiator . . . ." (Spec. 4, ll. 1-6). The colored molding composition produces "moldings with formaldehyde emission of less than 20 mg/kg, preferably less than 10 mg/kg." (*Id.* 4, ll. 8-9).

Representative claims 1, 2, 3, 15, and 25 read as follows:

> 1. A colored molding composition which comprises a polyacetal copolymer, wherein the polyacetal copolymer consisting essentially of oxymethylene units and oxyethylene units, and strong protonic acid and/or a derivative of a strong protonic acid was used as initiator during preparation of the polyacetal copolymer, and a colorant, and the emission of formaldehyde from the colored molding composition is lower than from a molding composition for which the polyacetal copolymer was prepared using a Lewis acid as initiator and wherein the formaldehyde emission, determined on test specimens in accordance with the German Automotive Industry

Recommendation No. 275 (VDA 275), is not more than 20 mg/kg.

2. The molding composition as claimed in claim 1, which comprises from 0.1 to 3.0% by weight of colorants selected from the group consisting of white pigments, black pigments, and color pigments.

3. The molding composition as claimed in claim 2, wherein the colorants carry a coating of an alkali metal salt of a fatty acid having at least 12 carbon atoms.

15. A process to prepare a molding composition which comprises preparing a polyacetal copolymer which consisting essentially of oxymethylene units and oxyethylene units, using trifluoromethanesulfonic acid and/or a derivative of trifluoromethanesulfonic acid as an initiator, mixing the polyacetal copolymer with at least one colorant selected from the group consisting of white pigments, black pigments and color pigments, and obtaining a colored polyacetal molding composition whose emission of formaldehyde is lower than from a molding composition for which the polyacetal copolymer was prepared using a Lewis acid as an initiator and wherein the formaldehyde emission, determined on test specimens in accordance with the German Automotive Industry Recommendation No. 275 (VDA 275), is not more than 20 mg/kg.

25. A process for reducing the formaldehyde emission of colored molding compositions made from polyacetal copolymer, which comprises preparing a polyacetal copolymer consisting essentially of oxymethylene units and oxyethylene units, using trifluoromethanesulfonic acid and/or a derivative of trifluoromethanesulfonic acid as an initiator, mixing the polyacetal copolymer with at least one colorant selected from the group consisting of white pigments, black pigments and color pigments, and obtaining a colored polyacetal molding composition whose emission of formaldehyde is lower than

from a molding composition for which the polyacetal copolymer was prepared using a Lewis acid as initiator.

The references relied upon by the Examiner to reject the claims on appeal are:

Chapman	US 3,656,982[1]	Apr. 18, 1972
Auerbach	US 4,666,995	May 19, 1987
Paul	US 4,727,106	Feb. 23, 1988
Mück	US 5,994,455	Nov. 30, 1999

The Examiner rejected claims 1-3, 11, 12, 14-19, and 21-26 under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Auerbach, Paul, Chapman, and Mück. (Ans. 3-5).

We affirm.

ISSUES

Have Appellants shown error in the Examiner's determination that the subject matter of claims 1-3, 11, 12, 14-19, and 21-26 would have been obvious to one of ordinary skill in the art over the collective teachings of the prior art?

FINDINGS OF FACT

[1] Although the Examiner lists Patent Number 3,956,982 for Chapman in the "Evidence Relied Upon" section, it is clear that the rejection under 35 U.S.C. § 103(a) is based on Chapman US Patent Number 3,656,982. (Ans. 3). The typographical error is harmless, as Appellants recognize the rejection is based on Chapman 3,656,982. (Br. 7).

The following findings of fact (FF) are supported in the record by a preponderance of the evidence:

1. Appellants acknowledge that it is known to prepare POM copolymer by copolymerizing trioxane with cyclic ethers, where "[t]he initiators usually used with cationic action are Lewis acids, such as BF_3, or strong protonic acids, such as perfluoroalkanesulfonic acids, $HClO_4$, or heteropolyacids. (Spec. 1, ll. 16-22).

2. Appellants' Specification states that the prior art "describes the use of POM as a carrier material for pigments." (Spec. 3, ll. 12-15).

3. Appellants state that colorants include pigments. (Spec. 4, ll. 3-5).

4. Appellants' Specification asserts "it has been found, surprisingly, that when using the formulation of the invention for the colored polyacetal molding composition, the selection of the colorants is no longer restricted to the conventional colorants particularly suitable for polyacetal, i.e. POM." (Spec. 5, ll. 29-32).

5. According to Appellants, "colored molding compositions made from POM copolymers which were prepared using strong protonic acids to initiate the polymerization have much lower emission values than those prepared from POM copolymers which were prepared using Lewis acids as initiators." (Spec. 4, ll. 11-15).

6. Appellants' Specification gives values of formaldehyde emission for the colored POM molding composition of the invention: "[f]or example, formaldehyde emission, measured on sheets of wall thickness 1 mm after 24 h of storage to VDA 275 is generally less than 20 mg/kg, preferably less than 10 mg/kg." (Spec. 5, ll. 34-37).

7. Appellants' Specification describes the POM copolymer preparation as:

> 96.6% by weight of trioxane, 3.4% by weight of dioxolane, and 1000 ppm of methylal were charged to a batch reactor at a temperature of 80°C and a pressure of about 1 bar. 0.2 ppm of trifluoromethanesulfonic acid dissolved in 500 ppm of methylal were added to this mixture. The amounts given are based on the entire monomer mixture. After an induction time of 30 seconds, the polymerization reaction began. The crude polymer formed was suspended in a water/triethylamine mixture and then hydrolyzed at 170°C in a water/methanol (10/90) mixture. On cooling to room temperature the polymer precipitated as a fine powder. The polymer was isolated by filtration with suction, washed with water, and dried.

(Spec 7, ll. 24-33).

8. Mück describes a POM copolymer preparation as:

> In a batch reactor operated at a temperature of about 80°C[.] and a pressure of about 1 atms., 96.6% by weight of trioxane was mixed with 3.4% by weight of dioxolane to form a monomer mixture. To this mixture 0.2 ppm of trifluoromethanesulfonic acid (TFMSA) dissolved in 500 ppm of formaldehyde dimethyl acetal (Methylal) were added, the quantities in ppm being based on the total weight of the monomer mixture. After an induction period of about 30 seconds the polymerization started. The obtained crude polymer was quenched in a water/triethylamine mixture and subsequently hydrolyzed at 170°C[.] in a water/methanol (10/90) mixture from which it was precipitated at room temperature.

(Mück, col. 3, line 57 – col. 4, line 2).

9. Mück discloses using strong protonic acid as an initiator in obtaining POM copolymers, particularly trifluoromethanesulfonic acid. (Mück, col. 3, ll. 1-4).

10. Auerbach and Paul discuss the preparation of POM copolymer from trioxane and cyclic ether (Auerbach: 0.1-15 mole percent cyclic ether; Paul: 0.4-40 mole percent cyclic ether) in the presence of a catalyst such as a Lewis acid like BF_3 and PF_5, or other acids like $HClO_4$ (perchloric acid) and H_2SO_4, which are protonic acids. (Auerbach, col. 3, ll. 32-38; Paul, col. 4, ll. 22-28).

11. Auerbach discusses POM copolymers "produced from the preferred cyclic ethers have a structure composed substantially of oxymethylene and oxyethylene groups in a ratio of from about 6 to 1 to about 1000 to 1." (Paul, col. 4, ll. 9-12).

12. Auerbach and Paul disclose colorants as optional ingredients used with POM copolymers (Auerbach, colorants and pigments, col. 8, ll. 61-66; Paul, color pigments, col. 11, ll. 12-21).

13. Appellants do not dispute the Examiner's factual findings (Ans. 4, 5) that the POM copolymers taught by Auerbach, Paul, or Mück are the same as that recited in appealed claim 1.

PRINCIPLES OF LAW

A claimed invention is unpatentable if the differences between it and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a)(2007).

"The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex*, 127 S. Ct. 1727, 1739 (2007).

ANALYSIS

Claims 1, 2, 11, 12, and 14.

We select claim 1 as representative of this group of claims and confine our discussion to this selected claim. 37 C.F.R. § 41.37(c)(vii).

Appellants do not dispute the Examiner's factual findings that Auerbach, Paul, and Mück individually describe the same POM copolymer recited in appealed claim 1. (FF 13). Rather, Appellants argue that the prior art references "applied against the claimed invention did not recognize nor solve" the problems of chemical instability and formaldehyde evolution during molding and processing where POM copolymer is used as a carrier for colored pigments while retaining the copolymers' required property profile. (Br. 7, ll. 12-15 and 21-22). Specifically, Appellants contend that a composition combining POM copolymer made with protonic initiators and colorants gives lower formaldehyde emissions than a colored composition containing POM copolymer made with Lewis acid initiators. (FF 5). In support, Appellants rely on the recited formaldehyde emission of not more than 20 mg/kg, determined in accordance with German Automotive Industry

Recommendation VDA 275, as reported in the data in the Specification at pages 7-10.

Appellants also argue that it is not obvious to modify the prior art POM copolymer with colorants discussed in Auerbach or Paul because these references list colorants as an ingredient among a list of optional ingredients, and the references do not provide any motivation or direction to particularly select colorants from among the ingredients. (Br. 8-9; 12, ll. 7-10, 15-18). Furthermore, Appellants argue that merely modifying the prior art does not make the "claimed invention, obvious unless the prior art suggested the desirability of such modification," (*Id.* 12, ll. 18-20), and that, even though combining the elements may have been obvious to try, a case of prima facie obviousness has not been established because there is no teaching, suggestion, or incentive for the combination. (Br. 13, ll. 9-13).

The Examiner asserts that the prior art discloses POM copolymer produced with a strong protonic acid initiator (Ans. 4-5) and a listing of optional ingredients to combine with POM copolymer. The Examiner continues that the prior art provides a suggestion to combine colorants with POM copolymers because "[t]he motivation to use any of these particular components is stated in the art-recognized uses, e.g. colorant." (Ans. 6, ll. 18-19), and "[t]he disclosure that these constituents are optional would present itself to a skilled artisan as motivation enough to select some, many, any or all of those optional components . . . ." (Ans. 6, line 21 – Ans. 7, line 1).

In view of the arguments and relied upon evidence, we cannot agree with Appellants. Though Auerbach, Paul, and Mück do not discuss

formaldehyde emission properties of colored molding compositions relative to compositions made with Lewis acid initiators or based on testing in accordance with VDA 275, each of these references discloses the same POM copolymer made with a strong protonic acid initiator as recited in appealed claim 1. (FF 1, 9, and 10). Additionally, Auerbach and Paul both teach the addition of a limited number of identified additives, such as a colorant. (FF 12). Furthermore, Appellants acknowledge it is known to use POM copolymer as a carrier for pigments, which Appellants identify as colorants. (FF 2, 3).

Appellants have explained that it is the recited POM copolymer that provides the recited formaldehyde emission characteristic when the copolymer is combined with a colorant. (FF 5, 6). As discussed, Auerbach and Paul both teach the same copolymer and also disclose the optional addition of an additive such as a colorant. Additionally, Mück discloses the same copolymer, and Appellants have acknowledged that it is known to add colorants to POM copolymers. Hence, the recited formaldehyde emission characteristic would flow naturally from preparing a colored composition according to the prior art. *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. App. & Int. 1985)(holding that the recognition of a result flowing naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious); *cf. Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999)("[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer.").

Moreover, the secondary considerations of non-obviousness (i.e., lower formaldehyde emissions and the formaldehyde emission values in accordance with VDA 275) do not outweigh the strong evidence of obviousness because Auerbach and Paul teach the same colored molding composition as recited in appealed claim 1. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1372 (2007)("[T]his secondary consideration does not overcome the strong showing of obviousness in this case. Although secondary considerations must be taken into account, they do not necessarily control the obviousness conclusion.").

Appellants' arguments that the teachings list a finite number of optional ingredients do not overcome the Examiner's obviousness determination but rather support it. *Cf. Upsher-Smith Laboratories, Inc. v. Pamlab LLC*, 412 F.3d 1319, 1322 (Fed. Cir. 2005)("'optional inclusion' of antioxidants teaches vitamin supplement compositions that both do and do not contain antioxidants.").

As discussed above, Appellants' recognition that a colored molding composition with polyacetal copolymer made using a protonic acid initiator has lower formaldehyde emissions compared to a colored molding composition where the polyacetal copolymer was made using a Lewis acid initiator does not detract from our determination that these properties would naturally flow from following the teachings of the prior art. Furthermore, one of ordinary skill in the art would know to follow the teachings of the prior art to use a known initiator, and to combine known colorants with known POM copolymer, according to their established functions, to

successfully obtain a colored molding composition. *KSR Int'l Co. v. Teleflex*, 127 S. Ct. 1727, 1739 (2007).

Claim 3.

Appellants do not argue that free-flowing particles, disclosed in Chapman (col. 1, ll. 37-40), would not have been desirable in the POM copolymers disclosed in Auerbach, Paul, and Mück. Rather, Appellants argue that one of ordinary skill in the art would not look to Chapman as a reference to combine with Auerbach, Paul, or Mück because it is non-analogous art; that it is "related to a totally different field of invention (cosmetic)." (Br. 13, ll. 21-22).

The Examiner asserts Chapman "teaches the known uses of nacreous pigment, as is recited in claims 3 and 17." (Ans. 7, ll. 11-12). The Examiner continues that "[r]egardless of the medium to which the colorant, pigment, may be entrained or mixed, it retains the feature that characterizes its use, that is, as a pigment." (*Id.* 7, ll. 13-15). Also, the Examiner asserts that "[a] skilled artisan would have motivation to choose the colorant for its art-recognized use." (Ans. 9, ll. 3-4).

Appellants have not shown error in the Examiner's rejection of claim 3. Appellants argue only that Chapman is from a different field. This argument is not dispositive to whether a reference is analogous art. Consideration must be given to, at least, design incentives and market forces that encourage variations of the teachings, whether one of ordinary skill in the art could make a predictable variation and see a benefit, and whether one of ordinary skill in the art has the skill to use the teachings in the same way

in another device. (*KSR*, 127 S. Ct. at 1731). Appellants did not discuss the problems addressed in the prior art, or argue that problems encountered in Chapman would not be applicable to problems in the invention. (Br. 13-15). Appellants' arguments of record are not a sufficient rebuttal to the Examiner's position and do not show the Examiner erred in rejecting the claims as obvious to one of ordinary skill in the art.

Claims 15, 16, 18, 19, and 21-23.

We select claim 15 as representative of this group of claims and confine our discussion to this selected claim. 37 C.F.R. § 41.37(c)(vii).

Appellants state that claim 15 recites using a specific initiator of trifluoromethanesulfonic acid and/or derivative, and choosing a colorant from white, black, and color pigments. (Br. 14, ll. 4-10). As in their arguments above with respect to claim 1, Appellants contend that there is no motivation or direction to combine teachings from the prior art, no suggestion for the desirability of modifying the prior art, and that, even though combining the elements may be obvious to try, a case of prima facie obviousness has not been established because there is no teaching, suggestion, or incentive for the combination. (Br. 14, line 16 – 15, line 14).

Mück discloses using a specific initiator of trifluoromethanesulfonic acid (FF 9), and Auerbach and Paul teach the use of colorants with POM copolymers (FF 12). This teaching of colorants falls within the claimed scope of "at least one colorant selected from the group consisting of white pigments, black pigments and color pigments . . . ." (Br. 20, ll. 4-5).

For reasons we discussed above with respect to claim 1, we find that Appellants have not shown that the Examiner erred in determining claim 25 as obvious to one of ordinary skill in the art, in view of the combined teachings of Auerbach, Paul, Mück, and Chapman. Appellants' recognition of lower formaldehyde emissions using POM copolymer initiated with protonic acid as compared to POM copolymer initiated with Lewis acid when combined with colorants, with the emission values less than 20 mg/kg when tested according to VDA 275, does not detract from our determinations that these properties would naturally flow from following the teachings of the prior art. *Ex parte Obiaya*, 227 USPQ at 60. Furthermore, according to *KSR*, one of ordinary skill in the art would find obvious the use of known elements according to known methods to achieve no more than predictable results.

Claim 17.

As with claim 3 above, Appellants argue that, although the limitation of "colorants carry a coating of an alkali metal salt of a fatty acid having at least 12 carbon atoms" is disclosed in Chapman, one of ordinary skill in the art would not have relied on Chapman because it is related to a different art. (Br. 15, ll. 16-23).

For reasons discussed above with respect to claim 3, we disagree. Appellants' arguments of record are not a sufficient rebuttal to the Examiner's position and do not show the Examiner erred in rejecting the claim as obvious to one of ordinary skill in the art.

Claim 24.

Appellants assert that the prior art does not teach "the formaldehyde emission, determined on test specimens in accordance with the German Automotive Recommendation No. 275 (VDA 275), is less than 10 mg/kg" and that this limitation is not inherent. (Br. 16, ll. 1-8).

Appellants have explained that the recited POM copolymer, when combined with colorants, gives emission levels less than 10 mg/kg (FF 5, 6). The prior art discloses the same POM copolymer initiated with protonic acid and combined with colorants.

For reasons discussed above with respect to claims 1 and 15, we find that Appellants have not satisfied their burden to show that the Examiner erred in finding claim 24 obvious in view of the prior art. Properties that naturally flow from making a colored composition when combining teachings of the prior art would be obvious to one of ordinary skill in the art.

Claims 25 and 26.

We select claim 25 as representative of this group of claims. 37 C.F.R. § 41.37(c)(vii).

Appellants argue that none of the references disclose reducing formaldehyde emissions, and that this claimed feature is not inherent. (Br. 16, ll. 14-15). Appellants also argue that claim 25 requires a trifluoromethanesulfonic acid initiator and/or derivative and a colorant selected from while pigments, black pigments, and colored pigments. (Br. 16, ll. 17-22).

Additionally, Appellants contend, as argued with respect to claims 1 and 15 above, that there is no motivation or direction to combine teachings from the prior art, and no suggestion for the desirability of modifying the prior art. (*Id.* 16, line 23 – 17, line 9). Applicants continue that, even though combining the elements may be obvious to try, a case of prima facie obviousness has not been established because there is no teaching, suggestion, or incentive for the combination. (Br. 17, ll. 13-17).

For reasons discussed above with respect to claims 1 and 15, we find that Appellants have not shown that the Examiner erred in determining claim 25 as obvious to one of ordinary skill in the art, in view of the combined teachings of Auerbach, Paul, Mück, and Chapman.

CONCLUSION

On this appeal record, we find that Appellants have failed to show that the Examiner reversibly erred in concluding that one of ordinary skill in the art would have found the subject matter of these appealed claims obvious over the prior art. Therefore, we sustain the rejection of claims 1-3, 11, 12, 14-19, and 21-26.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

PL initials:
sld

CONOLLY & HUTZ
P.O. BOX 2207
WILMINGTON, DE 19899